Upon entrance of the recording medium into the roller contact region, the fixing rollers perform an additional milling task, whereby the recording medium is temporarily braked (this experiences a sudden jarring) that is in the direction opposite the transport direction. The distance between fixing rollers and transfer printing region is often less than the length of the longest recording medium to be printed in compactly designed printers or copying devices and in particular in devices with two printing groups. By the "length" of the recording medium, what is always meant in the following is the dimension of the recording medium in the transport direction, thus the length of the edges of the recording medium that are arranged parallel to the transport path. Given a rectangular recording medium, these do not necessary have to be the "lengthwise edges", but rather can also be its transverse edges, namely when it is printed in the landscape format.

When the distance between the transfer printing region and the fixing rollers is shorter than the length of the recording medium, it can occur that the leading edge of the recording medium experiences a jarring in the roller contact region while the recording medium is still being printed at a rear section. In the event that this jarring transfers to the rear section, this leads to a smearing of the print image which is unacceptable.

The invention is based on the object to specify a device and a method of the previously cited type with which a print image of high quality can be generated given a compact design.

This object is inventively achieved via the features of the claims 1 and 21. Advantageous developments of the invention are specified in the further claims.

A compact design of the device inevitably leads to a small distance between transport ribbon and the fixing device. Due to the spatial proximity, the transport ribbon is likewise heated by the heat necessary for fixing, whereby it can deform and thereby be impaired with regard to its function. Moreover, given heating of

the transport ribbon the danger exists that toner located on it begins to melt and adheres on the transport ribbon.

The guided transport section is inventively arranged in a transport unit and the fixing device is inventively arranged in a fixing unit that are used independently of one another in the printer or copier and can be removed from these. Via the structural separation of the two units, no heat can be transferred over common components, for example circuit boards.

The fixing unit preferably has a wall designed as a hollow chamber profile that offers a good heat insulation. In a particularly advantageous development, the hollow chamber profile has openings through which air can be drawn for cooling of the transport unit.

In the device and a method according to an advantageous development of the invention, the recording medium lying on an electrostatically chargeable transport ribbon and adhered to this via electrostatic forces is transported along a subsequent guided transport section and conveyed, via a free transport section (subsequent to the guided transport section) in which the recording medium can freely arch, to a fixing device in which the recording medium is again guided in a fixed manner.

A "free transport section" designates in this document a transport section on which the recording medium freely arch, thus can form a wave or a buckle, whereby the distance between its front and rear edge is shortened. By forming an arch or wave, the shock that is exerted on its front edge upon entry of the recording medium into the roller contact region of the fixing roller can be absorbed.

The developed device or, respectively, method thus effectively prevents a smearing of the print image. On the one hand, a stronger adhesion can be achieved with the aid of an electrostatically-chargeable transport ribbon than with a vacuum table, such that the section of the recording medium located in the guided transport

Claims

1. Device for transfer printing of an electrostatically charged toner image from an intermediate carrier (10) of an electrographic printing or copying device onto a recording medium (24, 24'') and fixing of the transfer-printed toner image onto the recording medium (24, 24''),

in which the recording medium (24, 24'') lying on an electrostatically-chargeable transport ribbon (54) and adhering thereto due to electrostatic forces is transported through a transfer printing region (28) and along a guided transport section subsequent to this,

and in which the recording medium (24, 24'') is conveyed to a fixing device (36), whereby

the guided transport section is arranged in a transport unit (78) and the fixing device (36) is arranged in a fixing unit (80) that are used independent of one another in the printer or copier and can be removed from these.

2. Device according to claim 1, in which the transport unit (78) and the fixing unit (80) are designed as plug-in modules.

3. Device according to claim 1 or 2, in which the fixing unit (80) has at least one wall (88, 90) that hinders a heat transfer from the fixing unit (80) to the transport unit (78).

4. Device according to claim 3, in which the at least one wall is designed as a hollow chamber profile (88, 90).

5. Device according to claim 4, in which the hollow chamber profile (88) has openings (92) through which air is drawn to cool the transport unit (78).

6. Device according to claim 5, characterized in that the openings (92) in the hollow chamber profile (88) are arranged such that air is taken up into the hollow chamber profile (88) from the environment of the transport ribbon (54).

7. Device according to claim 5 or 6, in which an ozone filter is provided to filter the air taken up into the hollow chamber profile (88).

8. Device according to any of the claims 5 through 7, in which a fan is provided to draw the air into the hollow chamber profile (88), which fan runs for a predetermined time span after the deactivation of the printing or copying device.

9. Device according to any of the preceding claims, in which the transport ribbon (54) is a plastic ribbon with a specific volume resistance of between 10^{11} and 10^{15} Ωcm.

10. Device according to claim 9, in which the transport ribbon (54) is essentially comprised of polyvinylidenfluoride (PVDF).

11. Device according to any of the preceding claims, in which the recording medium (24, 24'') is conveyed to the fixing device (36) (in which it is again guided in a fixed manner) along a free transport section (subsequent to the guided transport section) in which the recording medium (24, 24'') can freely arch.

12. Device according to any of the preceding claims, in which the length (L_1) of the guided transport section is at least 1/3 of the length of the shortest recording medium to be printed.

13. Device according to any of the preceding claims, in which the length (L_1) of the guided transport section is between 100 mm and 210 mm.

14. Device according to any of the claims 11 through 13, in which the length (L_2) of the free transport section is at least 1/3 of the shortest recording medium to be printed and is shorter than the length of the shortest recording medium to be printed.

15. Device according to any of the claims 11 through 14, in which the length (L_2) of the free transport section is between 80 mm and 130 mm.

16. Device according to any of the preceding claims, in which the speed (v_f) with which the recording medium is conveyed through the fixing device (36) is between 97% and 100% of the speed (v_0) with which the recording medium is transported in the guided transport section.

17. Device according to any of the preceding claims, in which, at the end of the guided transport section, the transport band (54) is guided around a roller (56) that has a specific volume resistance of 10^7 to 10^9 Ωcm.

18. Device according to claim 17, in which the roller (56) is made from silicon.

19. Device according to claim 17 or 18, in which the roller (56) is a drive roller.

20. Device according to any of the preceding claims, with a discharge device (84) to discharge the toner located on the recording medium (24, 24'').

21. Method for transfer printing of an electrostatically charged toner image from an intermediate carrier (10) of an electrographic printing or copying

device onto a recording medium (24, 24', 24'') and fixing of the transfer-printed toner image onto the recording medium (24, 24''),

in which the recording medium (24, 24'') lying on an electrostatically-chargeable transport ribbon (54) and adhering thereto due to electrostatic forces is transported through a transfer printing region (28) and along a guided transport section subsequent to this,

and in which the recording medium (24, 24'') is conveyed to a fixing device (36), whereby

the guided transport section is arranged in a transport unit (78) and the fixing device (36) is arranged in a fixing unit (80) that are used independent of one another in the printer or copier and can be removed from these.

22. Method according to claim 21, in which the fixing unit (80) has at least one wall (88, 90) that hinders a heat transfer from the fixing unit (80) to the transport unit (78).

23. Method according to claim 22, in which the at least one wall is designed as a hollow chamber profile (88, 90) with openings (92) through which the air is drawn to cool the transport unit (78).

24. Method according to claim 23, in which air is taken up into the hollow chamber profile (88) from the environment of the transport ribbon (54).

25. Method according to claim 23 or 24, in which air taken up into the hollow chamber profile (88) is filtered with an ozone filter.

26. Method according to any of the claims 21 through 25, in which the transport ribbon (54) is essentially comprised of polyvinylidenfluoride (PVDF).

27. Method according to any of the claims 21 through 26, in which the recording medium (24, 24'') is conveyed to the fixing device (36) (in which it is again guided in a fixed manner) along a free transport section (subsequent to the guided transport section) in which the recording medium (24, 24'') can freely arch.

28. Method according to any of the claims 21 through 27, in which the length (L_1) of the guided transport section is at least 1/3 of the length of the shortest recording medium to be printed.

29. Method according to any of the claims 21 through 28, in which the length (L_1) of the guided transport section is between 100 mm and 210 mm.

30. Method according to any of the claims 27 through 29, in which the length (L_2) of the free transport section is at least 1/3 of the shortest recording medium to be printed and is shorter than the length of the shortest recording medium to be printed.

31. Method according to any of the claims 27 through 30, in which the length (L_2) of the free transport section is between 80 mm and 130 mm.

32. Method according to any of the claims 21 through 31, in which the speed (v_f) with which the recording medium is conveyed through the fixing device (36) is between 97% and 100% of the speed (v_0) with which the recording medium is transported in the guided transport section.

33. Method according to any of the claims 21 through 32, in which the toner located on the recording medium (24, 24'') is discharged with the aid of a discharge device (84).